## CLAIMS

- 1. Composition for dyeing keratinous fibres and in particular human keratinous fibres such as hair, containing in an appropriate dyeing medium, (i) at
- 5 least compound chosen from those of the following formulae (I), (III), (III), (IV):
  - a) the compounds of the following formula

(I):

$$A \longrightarrow D \longrightarrow D \longrightarrow N$$

$$X \longrightarrow R_{3}$$

$$R_{2}$$

$$R_{3}$$

$$R_{2}$$

$$R_{3}$$

10 in which:

D represents a nitrogen atom or the -CH group,

 $R_1$  and  $R_2$ , which are identical or different, represent a hydrogen atom; a  $C_1$ - $C_4$  alkyl radical which may be substituted with a -CN -OH or -NH<sub>2</sub> radical or form with a carbon atom of the benzene ring an optionally oxygen-containing or nitrogen-containing heterocycle which may be substituted with one or more  $C_1$ - $C_4$  alkyl radicals; a 4'-aminophenyl radical,

R<sub>3</sub> and R'<sub>3</sub>, which are identical or different, represent a hydrogen or halogen atom chosen from chlorine, bromine, iodine and fluorine, a cyano,  $C_1$ - $C_4$  alkyl,  $C_1$ - $C_4$  alkoxy or acetyloxy radical,

 $X^-$  represents an anion which is preferably chosen from chloride, methylsulphate and acetate, A represents a group chosen from the following structures  $A_1$  to  $A_{19}$ :  $R_4$   $R_4$ 

and
R
N
N
A
19

in which  $R_4$  represents a  $C_1$ - $C_4$  alkyl radical which may be substituted with a hydroxyl radical and  $R_5$  represents a  $C_1$ - $C_4$  alkoxy radical, with the proviso that when D represents -CH, A represents  $A_4$  or  $A_{13}$  and  $R_3$  is different from an alkoxy radical, then  $R_1$  and  $R_2$  do not simultaneously denote a hydrogen atom;

b) the compounds of the following formula

10 (II):

$$R = N = N$$

$$R_{9}$$

$$R_{7}$$

$$R_{7}$$

$$R_{9}$$

$$R_{7}$$

in which:

 $R_6$  represents a hydrogen atom or a  $C_1$ - $C_4$  alkyl radical,

R<sub>7</sub> represents a hydrogen atom, an alkyl radical which may be substituted with a CN radical or with an amino group, a 4'-aminophenyl radical or forms with R<sub>6</sub> an optionally oxygen-containing and/or nitrogen-containing heterocycle which may be substituted with a 20 C<sub>1</sub>-C<sub>4</sub> alkyl radical,

 $R_{\theta}$  and  $R_{\theta}$  , which are identical or different, represent a hydrogen atom, a halogen atom such as

bromine, chlorine, iodine or fluorine, a  $C_1-C_4$  alkyl or  $C_1-C_4$  alkoxy radical, a -CN radical,

X represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

B represents a group chosen from the following structures B1 to B6:

$$R_{10}$$
 $R_{10}$ 
 $R_{10}$ 
 $R_{11}$ 
 $R_{12}$ 
 $R_{13}$ 
 $R_{12}$ 
 $R_{13}$ 
 $R_{14}$ 
 $R_{15}$ 
 $R_{10}$ 
 $R$ 

in which  $R_{10}$  represents a  $C_1$ - $C_4$  alkyl radical,  $R_{11}$  and  $R_{12}$ , which are identical or different, represent a hydrogen atom or a  $C_1$ - $C_4$  alkyl radical;

c) the compounds of the following formulae (III) and (III'):

20

$$E-D_{:} = D_{2} - (N)_{m}$$

$$X = R_{13}$$

$$(III)$$

in which

 $R_{13}$  represents a hydrogen atom, a  $C_1$ - $C_4$  alkoxy radical, a halogen atom such as bromine, chlorine, iodine or fluorine or an amino radical,

 $R_{14}$  represents a hydrogen atom, a  $C_1$ - $C_4$  alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and/or substituted with one or more  $C_1$ - $C_4$  alkyl groups,

 $R_{15}$  represents a hydrogen or halogen atom such as bromine, chlorine, indine of fluorine,

 $R_{16}$  and  $R_{17}$ , which are identical or different, represent a hydrogen atom or a  $C_1$ - $C_4$  alkyl radical,

 $D_1$  and  $D_2$ , which are identical or different,

15 represent a nitrogen atom or the -CH group,

m = 0 or 1,

it being understood that when  $R_{13}$  represents an unsubstituted amino group, then  $D_1$  and  $D_2$  simultaneously represent a -CH group and m=0,

X represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

E represents a group chosen from the following structures E1 to E8:.

R' N+ E2 OH OH R' R' R' N+ E5 R' E5 R' And N+ R' E6 E7 E8

in which R' represents a  $C_1 \setminus C_4$  alkyl radical;

when m=0 and  $D_1$  represents a nitrogen atom, then E may also denote a group having the following structure E9:

10 in which R' represents a C1-C4 alkyl radical

d) the compounds of the following formula

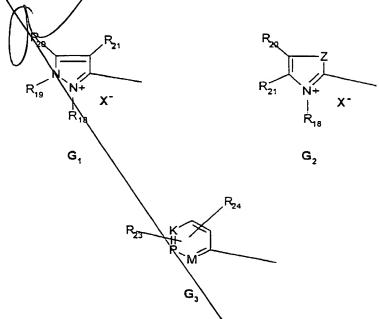
(IV):

G-N=N-C

(IV)

in which:

5 the symbol G represents a group chosen from the following structures  $G_1$  to  $G_3$ :



in which structures  $G_1$  to  $G_3$ ,

 $R_{18}$  denotes a  $C_1$ - $C_4$  alkyl radical, a phenyl radical which may be substituted with a  $C_1$ - $C_4$  alkyl radical or a halogen atom chosen from chlorine, bromine, iodine and fluorine;

 $R_{19}$  denotes a  $C_1$ - $C_4$  alkyl radical or a pheryl radical;

15  $R_{20}$  and  $R_{21}$ , which are identical or different, represent a  $C_1$ - $C_4$  alkyl radical, a phenyl radical, or form together in  $G_1$  a benzene ring which is substituted with one or more  $C_1$ - $C_4$  alkyl,  $C_1$ - $C_4$  alkoxy or  $NO_2$  radicals, or

form together in  $G_2$  a benzene ring which is optionally

substituted with one or more  $C_1\text{-}C_4$  alkyl,  $C_1\text{-}C_4$  alkoxy or  $NO_2$  radicals;

 $R_{20}$  may denote, in addition, a hydrogen atom;

Z denotes an oxygen or sulphur atom or an -NR<sub>19</sub> group;

5 M represents a group -CH, -CR (R denoting  $C_1$ - $C_4$  alkyl), or -NR<sub>22</sub> ( $X^-$ )<sub>r</sub>;

K represents a group -CH, -CR (R denoting  $C_1$ - $C_4$  alkyl), or -NR<sub>22</sub>(X<sup>-</sup>)

P represents a group -CH, -CR (R denoting  $C_1$ - $C_4$  alkyl),

10 or -NR<sub>22</sub>(X<sup>-</sup>)<sub>r</sub>; r denotes zero or 1;

 $R_{22}$  represents an  $0^-$  atom, a  $C_1$ - $C_4$  alkoxy radical or a  $C_1$ - $C_4$  alkyl radical;

 $R_{23}$  and  $R_{24}$ , which are identical or different, represent a hydrogen or halogen atom chosen from chlorine,

bromine, iodine and fluorine, a  $C_1-C_4$  alkyl radical, a  $C_1-C_4$  alkoxy radical or an  $-NO_2$  radical;

X represents an anion which is preferably chosen from chloride, iodide, methylsulphate ethylsulphate, acetate and perchlorate;

20 with the proviso that

if R<sub>22</sub> denotes O, then r denotes zero;

if K or P or M denote  $-N-(C_1-C_4 \text{ alkyl})X^-$ , then  $R_{23}$  or  $R_{24}$ 

is different from a hydrogen atom;

if K denotes  $-NR_{22}(X^{-})_{r'}$ , then M = P = -CH, -CR;

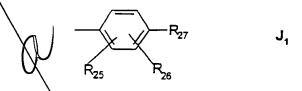
25 if M denotes  $-NR_{22}(X^{-})_r$ , then K = P = -CH, -CR;

if P denotes  $-NR_{22}(X^{-})_{r}$ , then K = M and denote -CR or -CR;

if Z denotes a sulphur atom with  $R_{21}$  denoting  $C_1-C_4$  alkyl, then  $R_{20}$  is different from a hydrogen atom; if Z denotes  $-NR_{22}$  with  $R_{19}$  denoting  $C_1-C_4$  alkyl, then at least one of the  $R_{18}$ ,  $R_{20}$  or  $R_{21}$  radicals of  $G_2$  is different from a  $C_1-C_4$  alkyl radical;

## the symbol J represents:

-(a) a group having the following structure  $J_1$ :



10 in which structure  $J_1$ ,

 $R_{25}$  represents a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a  $C_1-C_4$  alkyl radical, a  $C_1-C_4$  alkoxy radical, a radical -OH, -NO<sub>2</sub>, -NHR<sub>28</sub>, -NR<sub>29</sub>R<sub>30</sub>, -NHCO( $C_1-C_4$ alkyl), or forms with

 $R_{26}$  a 5- or 6-membered ring containing or otherwise one or more heteroatoms chosen from nitrogen, oxygen or sulphur;

 $R_{26}$  represents a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a  $C_1\!-\!C_4$ 

alkyl or  $C_1$ - $C_4$  alkoxy radical, or forms with  $R_{27}$  or  $R_{28}$  a 5- or 6-membered ring containing or otherwise one or more heteroatoms chosen from nitrogen, oxygen or sulphur;

 $\ensuremath{\text{R}_{\text{27}}}$  represents a hydrogen atom, an -OH radical, an -NHR28

25 radical, an -NR<sub>29</sub>R<sub>30</sub> radical;

 $R_{28}$  represents a hydrogen atom, a  $C_1-C_4$  alkyl radical, a

 $C_1-C_4$  monohydroxyalkyl radical, a  $C_2-C_4$  polyhydroxyalkyl radical, a phenyl radical;

 $R_{29}$  and  $R_{30}$ , which are identical or different, represent a  $C_1$ - $C_4$  alkyl radical, a  $C_1$ - $C_4$  monohydroxyalkyl radical, a  $C_2$ - $C_4$  polyhydroxyalkyl radical;

(b) a 5- or 6- membered nitrogen-containing heterocycle group which is capable of containing other heteroatoms and/or carbonyl-containing groups and which may be substituted with one or more  $C_1$ - $C_4$  alkyl, amino

10 or phenyl radicals, and in particular a group having the following structure  $J_2$ :

15 in which structure  $J_2$ ,

 $R_{31}$  and  $R_{32}$ , which are identical or different, represent a hydrogen atom, a  $C_1-C_4$  alkyl radical, a phenyl radical;

Y denotes the -CO- radical or the radical

20 n = 0 or 1, with, when n denotes 1, U denotes the -CO-radical.

the said composition being characterized in that it contains, in addition,

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(ii) at least one quaternary ammonium salt chosen from the group comprising:

 $(ii)_1$  - those of the following formula (V):

5 in which,

the radicals R<sup>1</sup> to R<sup>4</sup>, which are identical or different, denote a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising from 1 to about 30 carbon atoms, or an alkoxy, alkoxycarbonylalkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl or alkylaryl radical comprising from 12 to about 30 carbon atoms, with at least one radical among R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> denoting a radical comprising from 8 to 30 carbon atoms;

X is an anion chosen from the group comprising halides, phosphates, acetates, lactates and alkyl sulphates;

20 (ii)<sub>2</sub> - the imidazolium salts of the following formula (VI):

$$\begin{bmatrix} R^5 \\ N \\ CH_2 - CH_2 - NH - CO - R^5 \end{bmatrix} + CH_3 SO_4$$

in which,

R<sup>5</sup> is chosen from the alkenyl and/or alkyl radicals comprising from 13 to 31 carbon atoms and derived from tallow fatty acids.

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(ii)<sub>3</sub> - the quaternary diammonium salts of the following formula (VII):

$$\begin{bmatrix} R^7 & R^9 \\ R^6 & N - (-CH_2) & N - R^{11} \\ R^8 & R^{10} \end{bmatrix}$$
(VII)

in which,

10 R° de to 30 chose

 $R^6$  denotes an aliphatic radical comprising from 16 to 30 carbon atoms,  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$  and  $R^{11}$  are chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms, and  $X^-$  is an anion chosen from the group comprising halides, acetates, phosphates and sulphates.

15

2. Composition according to Claim 1, characterized in that the cationic direct dyes of formula (I) are chosen from the compounds corresponding to the following structures (II) to (I54):

20

$$CH_3$$
 $N=N-CH_3$ 
 $CH_3$ 
 $CH_$ 

$$\begin{array}{c}
CH_3 \\
N + \\
CH_3
\end{array}$$

$$CH_3 \\
CH_3$$

$$CH_3 \\
CH_3$$

$$H_3C-N+$$
 $CH$ 
 $CH$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$H_3C-N+$$
 $CH=CH C_2H_4CN$ 
 $C_1$ 
 $C_2$ 

$$HO-H_4C_2-N+$$
 $CH=CH CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$CH_3$$
 $N+$ 
 $N=$ 
 $N=$ 
 $CH_3$ 
 $CH_3$ 

$$CH_3$$
 $N+$ 
 $N=$ 
 $N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$\begin{array}{c|c}
CH_3 \\
N+ \\
N+ \\
CH_3
\end{array}$$

$$\begin{array}{c|c}
NH_2 \\
OCH_3
\end{array}$$

$$\begin{array}{c|c}
CI \\
\end{array}$$

$$\begin{array}{c|c}
(I11)
\end{array}$$

$$CH_3$$
 $N+$ 
 $N=N$ 
 $C_2H_5$ 
 $C_2H_5$ 
 $C_2H_5$ 

$$CH_3$$
 $N+$ 
 $N=N$ 
 $C_2H_4-CN$ 
 $C_2H_4-CN$ 
 $C_2H_4-CN$ 
 $C_2H_4-CN$ 
 $C_3$ 

$$\begin{array}{c|c}
CH_3 \\
N+ \\
CH_3
\end{array}$$

$$CI \qquad (114)$$

$$CH_3$$
 $N+$ 
 $N=N CH_3$ 
 $CH_3$ 
 $CI$ 
 $CH_3$ 
 $CI$ 
 $CI$ 

$$CH_3 \qquad N+ \qquad N=N \qquad NH_2 \qquad CI. \qquad (I16)$$

$$H_3C$$

$$N+$$

$$N=N$$

$$C_2H_5$$

$$C_1$$

$$C_2H_5$$

$$\begin{array}{c|c} CH_3 \\ \hline N \\ \hline N \\ \hline N \\ CH_3 \end{array}$$

$$N = N$$

$$CI$$

$$C_2H_5$$

$$CH_3$$

$$CI$$

$$CH_3$$
 $N$ 
 $N=N$ 
 $CI$ 
 $CH_2$ - $CH_2$ - $OH$ 
 $CH_3$ 
 $CH_3$ 

$$CH_3$$
 $N=N$ 
 $CI$ 
 $CH_2$ - $CH_2$ - $CN$ 
 $CH_3$ 

$$\begin{array}{c|c}
 & CH_3 \\
\hline
 & CH_3 \\
\hline
 & CH_3
\end{array}$$

$$\begin{array}{c}
 & CI \\
\hline
 & CH_3
\end{array}$$

$$\begin{array}{c}
 & CI \\
\hline
 & CH_3
\end{array}$$

$$CH_3$$
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$CH_3$$
 $N+$ 
 $N=N$ 
 $CH_2$ - $CH_2$ - $CN$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$CH_3$$
  $O-CH_3$   $O-CH_3$   $O-CH_3$   $O-CH_3$   $O-CH_3$   $O-CH_3$   $O-CH_3$ 

$$CH_3$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_$ 

$$\begin{array}{c}
CH_3 \\
N \\
N+ \\
CH_3
\end{array}$$

$$N = N - NH - NH_2 \qquad CI \qquad (I31)$$

$$N = N - NH_2 \qquad CI \qquad (132)$$

$$CH_3 \qquad CH_3$$

$$\begin{array}{c|c} & CH_3 \\ \hline \\ CH_3 \\ \hline \end{array} \qquad CI \qquad (I33)$$

$$H_3C-O$$
 $N=N+$ 
 $N=N+$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$N = N$$

$$N = N$$

$$CI$$

$$CH_3$$

$$CI$$

$$CI$$

$$CI$$

$$H_3C-O$$
 $N=N+$ 
 $N=N N=N O-CH_3$ 
 $CH_3$ 
 $CH_$ 

$$H_3C$$
 $O$ 
 $N+$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$N = N - N - N - CH_3 - CI - CH_3$$

$$CH_3 - CH_3 - CI - CH_3$$

$$CH_3 - CH_3 - CI - CH_3$$

$$CH_3$$
 $N=N$ 
 $N=N$ 
 $N+$ 
 $CH_3$ 
 $N+$ 
 $CH_3$ 

$$CH_3$$
 $N+$ 
 $N=N$ 
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 $N+$ 
 $N=N$ 
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$$CH_3$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_$ 

$$C_2H_5$$
 $N+$ 
 $CH_3$ 
 $CH_3SO_4$ 
 $CH_3$ 
 $CH_3$ 

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Composition according to Claim 2, characterized in that the cationic direct dyes correspond to the structures (II), (I2), (I14), and (I31).

5

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characterized in that the cationic direct dyes of formula (II) are chosen from the compounds

Composition according to Claim 1

corresponding to the following structures (II1) to

(II9):

$$H_3C$$
 $N=N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$N+$$
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_$ 

10

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_$ 

## 5. Composition according to Claim 1,

5 - characterized in that the cationic direct dyes of

formula (III) are chosen from the compounds corresponding to the following structures (III1) to (III18):

$$CH = N - N - CH_3$$

$$CH_3$$

$$CH_3$$

$$CH_3$$

$$CH_3$$

$$CH_3$$

$$H_3C$$
 $N$ 
 $CH=N-N$ 
 $CH=N$ 
 $C$ 

$$H_3C$$
 $N$ 
 $CH=N$ 
 $CH=$ 

$$H_3C-N+$$
 $CH=N-N$ 
 $CH_3$ 
 $CH_3SO_4$  (III4)

$$H_3C-N+$$
 $CH=N-N$ 
 $CH_3$ 
 $CH_3$ 
 $CI$ 
 $(III5)$ 

$$H_3C-N+$$
 $CH=N-N$ 
 $CH_3SO_4$ 
(III6)

$$CH_3$$
 $CH_3$ 
 $CH_3$ 

$$H_3C-N+$$
 $CH=N-N$ 
 $CH_3$ 
 $CH=N-N$ 
 $CH=N$ 
 $CH=N$ 

$$H_3C-N+$$
 $CH=N-N$ 
 $CH_3$ 
 $CI$ 
 $CI$ 
 $CI$ 
 $CIII9)$ 

$$CH=N-N-CH_3$$

$$CH_3$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH=N-N$$

$$CH_3SO_4$$

$$CH_3$$

$$CH_3$$

$$CH = N - N - CI \quad CH_3SO_4 \quad (III12)$$

$$CH_3$$

$$H_3C-N+$$
 $CH=N-N CH_3$ 
 $CH_3SO_4$  (III13)

$$CH=CH$$
 $NH_2$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$H_3C-N+$$
 $CH=N-N$ 
 $CH_3$ 
 $CI$ 
 $(III17)$ 

; and

$$CI$$
 $N=N$ 
 $H_3C$ 
 $N+$ 
 $CH_3$ 
 $CH_3$ 
 $CI$ 
 $CI$ 
 $CI$ 
 $CH_3$ 

6. Composition according to Claim 5, characterized in that the cationic direct dyes of formula (III) are chosen from the compounds corresponding to the structures (III4), (III5) and (III13).

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## Composition according to Claim 1,

formula (III') are chosen from the compounds

corresponding to the following structures (III'1) to

(III'3):

$$CH_3-N+$$
 $CH=CH$ 
 $NH$ 
 $CI$  (III'2)
 $CH=CH$ 

8. Composition according to Claim 1,

characterized in that the cationic direct dyes of formula (IV) are chosen from the compounds

5 corresponding to the following structures  $(IV)_1$  to  $(IV)_{77}$ :

And then the fact that are the first first present the first present that the first true for the first true from the first true first true for the first true from the

$$N+N=N-CH_3$$

$$CH_3$$

$$CH_3$$

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$$N+N=N-N+CCH_3$$

$$CH_3$$

$$CH_3$$

$$CH_3$$

$$N+N=N-O-N < CH_2CH_2OH CH_2CH_2OH (IV)_4$$

$$N+N=N-N+2$$

$$|V|=N+1$$

$$|V|=N+1$$

$$|V|=N+1$$

$$N+N=N-N-N$$

$$(IV)_{6}$$

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_2CH_2OH$ 
 $CH_2CH_2OH$ 
 $CH_2CH_2OH$ 

$$H_3C$$
 $N+$ 
 $N=N$ 
 $C_2H_5$ 
 $C_2H_5$ 
 $C_2H_5$ 

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$\begin{array}{c|c}
CH_3 \\
N+ \\
N=N \\
\hline
CH_3 \\
CH_3
\end{array}$$
(IV)<sub>10</sub>

$$N+N=N$$
 $N=N$ 
 $C_2H_5$ 
 $C_2H_5$ 
 $C_2H_5$ 

$$\begin{array}{c|c} CH_3 \\ \hline \\ N+ \\ \hline \\ O- \\ \end{array} N=N - \begin{array}{c} CH_2CH_2OH \\ CH_2CH_2OH \\ \end{array} \qquad \text{(IV)}_{12}$$

$$H_3C \longrightarrow N+ N=N \longrightarrow NH_2$$
 (IV)<sub>14</sub>

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$\begin{array}{c|c} CH_3 & NHCOCH_3 \\ \hline N+ N=N & CH_3 \\ \hline CH_3 & CH_3 \end{array}$$

$$\begin{array}{c|c}
 & H_3C \\
 & \downarrow \\
 &$$

$$\begin{array}{c|c} H_3C \\ \hline N+ \\ N=N \\ \hline \end{array} \begin{array}{c} CH_3 \\ CH_3 \end{array} \hspace{1cm} \text{(IV)}_{20}$$

$$N+$$
 $N=N$ 
 $C_2H_5$ 
 $C_2H_5$ 
 $C_2H_5$ 

$$N+N=N-V_{C_2H_5}$$
 $C_2H_5$ 
 $C_2H_5$ 

$$\begin{array}{c|c} CI & H_3C \\ \hline N+ & N=N \\ \hline \\ CH_3 & CH_3 \\ \hline \\ CH_3 & CH_3 \end{array}$$

$$CH_3$$

$$N+N=N$$

$$N=N$$

$$(IV)_{24}$$

$$N=N - CH_3$$

$$CH_3$$

$$CH_3$$

$$N=N - CH_2CH_2OH$$

$$CH_2CH_2OH$$

$$CH_2CH_2OH$$

$$CH_2CH_2OH$$

$$CH_2CH_2OH$$

$$\begin{array}{c|c} & & & \\ & \downarrow \\ & \downarrow \\ & CH_3 \\ & CH_3SO_4 \end{array} \qquad (IV)_{27}$$

$$\begin{array}{c|c}
\hline
N+ & N=N & \longrightarrow & NH_2 \\
\hline
CH_3 & CH_3SO_4 & \longrightarrow & 
\end{array}$$

$$\begin{array}{c|c} CH_3 \\ N+N=N & NH_2 \\ CH_3 & CH_3SO_4 \end{array}$$

$$\begin{array}{c} CH_{3} \\ N+ \\ I\\ CH_{3} \end{array}$$

$$CH_{2}CH_{2}OH \\ CH_{2}CH_{2}OH \\ CH_{2}CH_{2}OH \end{array} \qquad (IV)_{30}$$

$$\begin{array}{c|c}
 & C_{2}H_{5} \\
 & C_{2}H_{5}
\end{array}$$

$$CH_{3}SO_{4}^{-}$$
(IV)<sub>31</sub>

$$CH_3$$

$$N+N=N-CH_3$$

$$CH_3$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$\begin{array}{c|c}
CI & CH_3 \\
CH_3 & CH_3 \\
CH_3SO_4
\end{array}$$

$$H_3C \xrightarrow{N+} N=N \xrightarrow{\qquad \qquad } N \xrightarrow{\qquad \qquad } H$$

$$CH_3SO_4$$

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_3SO_4$ 
 $CH_3$ 
 $CH_3SO_4$ 

$$\begin{array}{c|c} & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

$$N=N - CH_3 CH_3 CH_3$$

$$CH_3 SO_4$$

$$CH_3$$

$$N = N - CH_3$$

$$CH_3$$

$$CH_3SO_4$$

$$CH_3$$

$$CH_3$$

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$$CH_3$$

$$N = N \xrightarrow{H_3C} NCH_3$$

$$C_2H_5SO_4$$

$$C_2H_5$$

$$C_2H_5$$

$$N=N \xrightarrow{CH_3} N = N \xrightarrow{CH_3} CH_3$$

$$CH_3 CH_3 SO_4$$

$$CH_3$$

$$CH_3 CH_3 SO_4$$

$$N = N \xrightarrow{N+} C_2H_5SO_4$$

$$C_2H_5$$

$$C_2H_5$$

$$C_2H_5$$

$$C_3$$

$$C_4$$

$$C_4$$

$$C_4$$

$$C_5$$

$$C_7$$

$$C_8$$

$$N = N$$

$$N = N$$

$$CH_3$$

$$CH_3$$

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$$CH_3SO_4$$

$$C_6H_5$$

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$$\begin{array}{c|c} S \\ N+ N=N \\ \hline \\ CH_3 & CIO_4 \end{array}$$
  $CIO_4$   $CH_3$   $CIO_4$   $CIO_4$ 

$$\begin{array}{c|c}
CH_3 \\
N+N=N \\
CH_3 \\
CIO_4
\end{array}$$

$$\begin{array}{c|c}
CH_3 \\
CH_3
\end{array}$$

$$\begin{array}{c|c}
CH_3 \\
CH_3
\end{array}$$

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$$\begin{array}{c|c} & & & \\ & & & \\ N+ & N=N \\ & & \\ CH_3 & 1 \end{array}$$

$$\begin{array}{c|c} & & \\ NH_2 & \\ & & \\ NH_2 & \\ \end{array}$$

$$(IV)_{49}$$

$$H_3C \longrightarrow N+ N=N \longrightarrow NH$$

$$CIO_4 OH$$

$$OH$$

$$(IV)_{50}$$

$$\begin{array}{c|c}
 & S \\
 & N+ \\
 & N=N \\
 & CI^{-} \\
 & OH
\end{array}$$
(IV)<sub>51</sub>

$$NH_{2}$$

$$NH_{2}$$

$$OCH_{3}$$

$$(IV)_{53}$$

$$\begin{array}{c|c} & CH_3 \\ \hline N+N=N-NH_2 \\ \hline OCH_3 \\ CIO_4 \\ NH_2 \\ \end{array}$$
 (IV)<sub>55</sub>

$$N+N=N$$
 $O-N$ 
 $O-N+1$ 
 $O-N+1$ 

$$CH_3$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$\begin{array}{c|c} & & & \\ &$$

$$N+N=N$$
 $CH_3$ 
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$$N+N=N$$
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$$N+N=N-N$$

$$CH_3$$

$$CH_3$$

$$CH_3$$

$$N+N=N \longrightarrow OH$$

$$V=N$$

$$\begin{array}{c|c}
 & CH_3 \\
 & NO_2
\end{array}$$

$$H_3C$$
 $N+$ 
 $N=N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

$$V_{\text{CH}_3}$$
 $V_{\text{CH}_3}$ 
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$$\begin{array}{c|c}
 & CH_3 \\
 & CH_3 \\
 & CH_3 \\
 & CH_3SO_4
\end{array}$$
(IV)<sub>67</sub>

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$$\begin{array}{c|c}
 & NH_2 \\
 & N+N=N \\
 & NH_2 \\
 & CH_3
\end{array}$$
(IV)<sub>70</sub>

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$$N = N - \sqrt{NH_2}$$

$$V = N - \sqrt{(IV)_{72}}$$

$$N=N - CH_2CH_2OH$$

$$CH_2CH_2OH$$

$$CH_3CH_3OH$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$CH_3SO_4$$

$$N = N - NH_{2}$$

$$N =$$

$$N = N - NH_{2}$$

$$N = N - NH_{2}$$

$$CH_{3}SO_{4} - NH_{2}$$

$$CH_{3}SO_{4} - NH_{2}$$

$$(IV)_{75}$$

$$CH_3$$
 $N+N=N$ 
 $NH_2$ 
 $NH_2$ 

(IV)<sub>76</sub>

$$N=N$$
 $N=N$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 
 $CH_3$ 

(IV)<sub>77</sub>

- 9. Composition according to any one of the preceding claims, characterized in that the cationic direct dye(s) of formulae (I), (II), (III), (III') or (IV) represent from 0.001 to 10% by weight of the total weight of the composition.
- 10. Composition according to Claim 9, characterized in that the cationic direct dye(s) of formulae (I), (II), (III), (III') or (IV) represent from 0.005 to 5% by weight of the total weight of the composition.
- 11. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt (ii) of formula (V) is a
- 15 dialkyldimethylammonium or alkyltrimethylammonium salt in which the alkyl radical comprises from 12 to 22 carbon atoms.

- 12. Composition according to Claim 11, characterized in that it is distearyldimethylammonium chloride cetyltrimethylammonium chloride or behenyltrimethylammonium chloride.
- 18. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt (ii) of formula (V) is a  $di(C_1-C_2$  alkyl)  $(C_{12}-C_{22}$  alkyl) hydroxy  $(C_1-C_2$  alkyl) ammonium salt.
  - 14. Composition according to Claim 13,
- 10 characterized in that it is oleocetylhydroxyethylammonium chloride.
  - 15. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt (ii) of formula (V) is
- 15 stearamidopropyldimethyl (myristyl acetate) ammonium chloride of formula:

$$CH_{3} \xrightarrow{\text{CH}_{2} \to \text{COOC}_{14}H_{20}} CONH \xrightarrow{\text{CH}_{2} \to \text{COOC}_{14}H_{20}} CI^{-}$$

- 16. Composition according to any one of the preceding claims, characterized in that the quaternary 20 ammonium salt(s) (ii) represent from 0.01 to 10% by weight of the total weight of the dyeing composition.
- 17. Composition according to Claim 16, characterized in that the quaternary ammonium salt(s) represent from 0.05 to 5% by weight of the total weight of the dyeing composition.

- 18. Composition according to any one of the preceding claims, characterized in that the appropriate dyeing medium (or carrier) consists of water or of a mixture of water and of at least one organic solvent.
- 5 19 Composition according to any one of the preceding claims, characterized in that it has a pH of between 2 and 1 and preferably between 5 and 10.
- 20. Composition according to any one of the preceding claims, characterized in that it is intended of for oxidation dyeing and in that it contains one or more oxidation bases chosen from the paraphenylenediamines, the bis-phenylalkylenediamines, the para-aminophenols, the ortho-aminophenols and the heterocyclic bases.
- 21. Composition according to Claim 20, characterized in that the oxidation base(s) represent 0.0005 to 12% by weight of the total weight of the dyeing composition.
- 22. Composition according to Claim 21,
  20 characterized in that the oxidation base(s) represent
  0.005 to 6% by weight of the total weight of the dyeing composition.
- 23. Composition according to any one of Claims 20 to 22, characterized in that it contains one or more couplers chosen from the the meta-phenylenediamines, the meta-aminophenols, the meta-diphenols and the heterocyclic couplers.

- 24. Composition according to Claim 23, characterized in that the coupler(s) represent from 0.0001 to 10% by weight of the total weight of the dyeing composition.
- 25 Composition according to Claim 24, characterized in that the coupler(s) represent from 0.005 to 5% by weight of the total weight of the dyeing composition.
- 26. Composition according to any one of the preceding claims, characterized in that it is intended for direct lightening dyeing or oxidation dyeing and in that it then contains at least one oxidizing agent.
- 27. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair,

  15 characterized in that at least one dyeing composition as defined in any one of Claims 1 to 26 is applied to the fibres for a sufficient time to develop the desired colour, after which they are rinsed, optionally washed with shampoo, rinsed again and dried.
- 28. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that at least one dyeing composition as defined in any one of Claims 1 to 26 is applied to the fibres for a sufficient time to develop the desired colour, with no final rinsing.
  - 29. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that it comprises a preliminary stage

consisting of storing in a separate form, on the one hand, a composition (A1) comprising, in an appropriate dyeing medium, at least one cationic direct dye (i) as dafined in the preceding claims and at least one oxidation base and, on the other hand, a composition (B1) containing, in an appropriate dyeing medium, at least one oxidizing agent, and then mixing them at the time of whe before applying this mixture to the keratinous fibres, the composition (A1) or the 10 composition (B1) containing the quaternary ammonium salt (ii) as defined in the preceding claims.

- 30. Wethod of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that it comprises a preliminary stage 15 consisting of storing in a separate form, on the one hand, a composition (AQ) comprising, in an appropriate dyeing medium, at least one cationic direct dye (i) as defined in the preceding alaims and, on the other hand, a composition (B2) containing, in an appropriate dyeing medium, at least one oxidizing agent, and then mixing them at the time of use before applying this mixture to the keratinous fibres, the composition (A2) or the composition (B2) containing the quaternary ammonium salt (ii) as defined in the preceding claims.
- 25 31. Multicompartment device or multicompartment dyeing "kit", characterized in that a first compartment contains composition (A1) or (A2) as defined in Claim 29 or 30 and a second compartment